



Mt. Simon Hub

Public Information Meetings



Who We Are

Wolf Carbon Solutions U.S., LLC (Wolf Carbon Solutions) is an industry leading energy infrastructure company with over **three decades of experience** safely developing and operating pipeline transportation systems.

Our team is comprised of **established veterans** with proven expertise in the pipeline and infrastructure development space and has **safely developed thousands of miles of pipeline** infrastructure over the past 10 years.

Wolf Carbon Solutions is a **life-of-asset** company, an affiliate of the Canadian energy platform, Wolf Midstream, and **wholly owned and funded by CPP Investments** - a \$500B pension fund with a portfolio **that includes multiple U.S. renewable energy assets**.



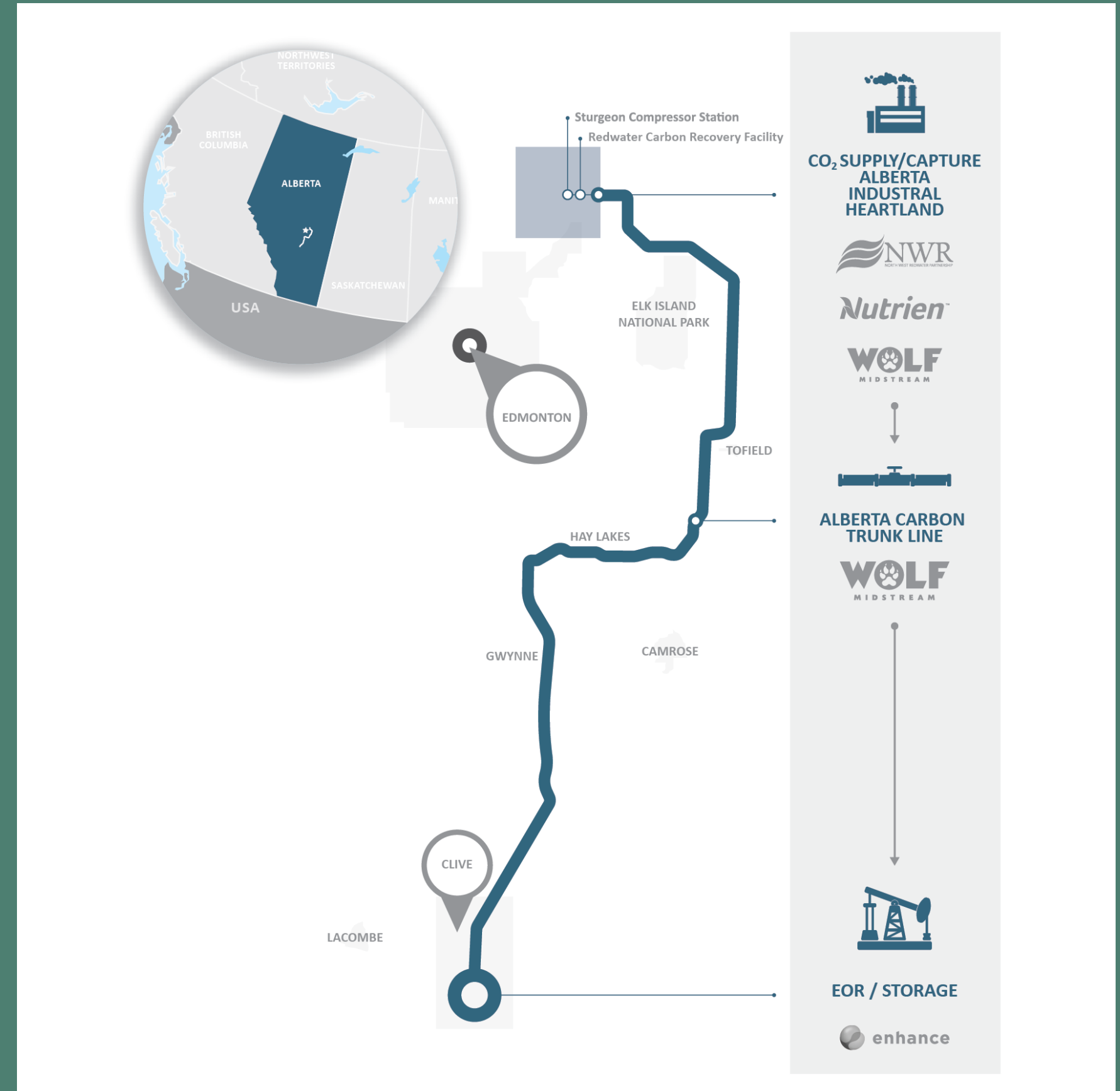
Wolf Carbon Solutions | Mt. Simon Hub

Our Experience Sets Us Apart

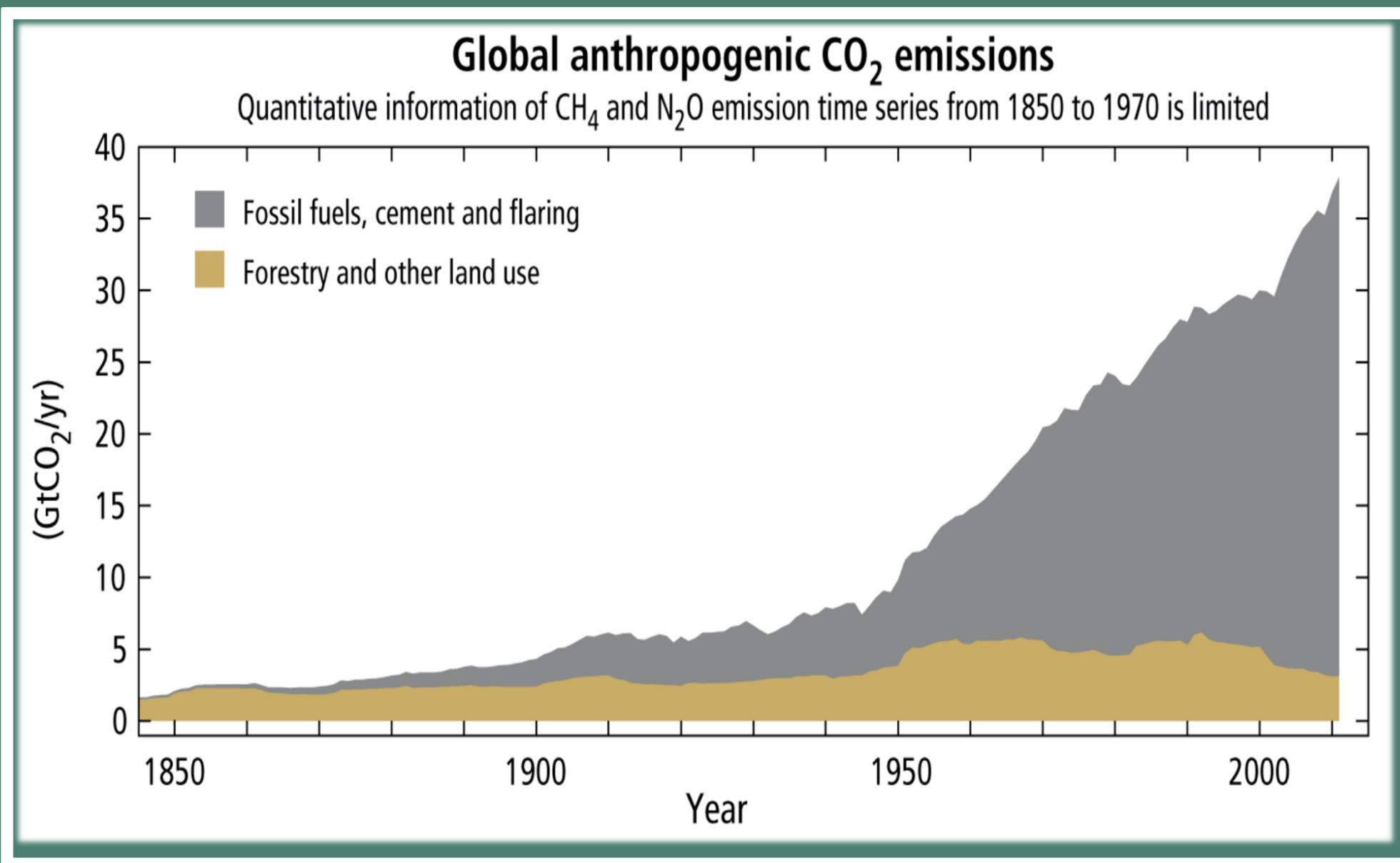
Our affiliate, Wolf Midstream, owns and safely operates the Alberta Carbon Trunk Line (ACTL).

- This is the largest third-party carbon dioxide (CO₂) capture system in North America.
- This 150-mile pipeline and capture system entered service in 2020.
- This infrastructure system has **safely captured and transported three million tons of CO₂ to date**. It can transport up to 14.6 million tons of CO₂ per year.

We are proud that the entire ACTL right-of-way (ROW) was **voluntarily negotiated with landowners and rightsholders** without using the right of eminent domain or condemnation.



Iowa Leads the Nation in Ethanol Production



Source: U.N. Intergovernmental Panel on Climate Change

*Source: Goss and Associates

Over 60%* of Iowa's non-food grade corn goes to ethanol production each year.

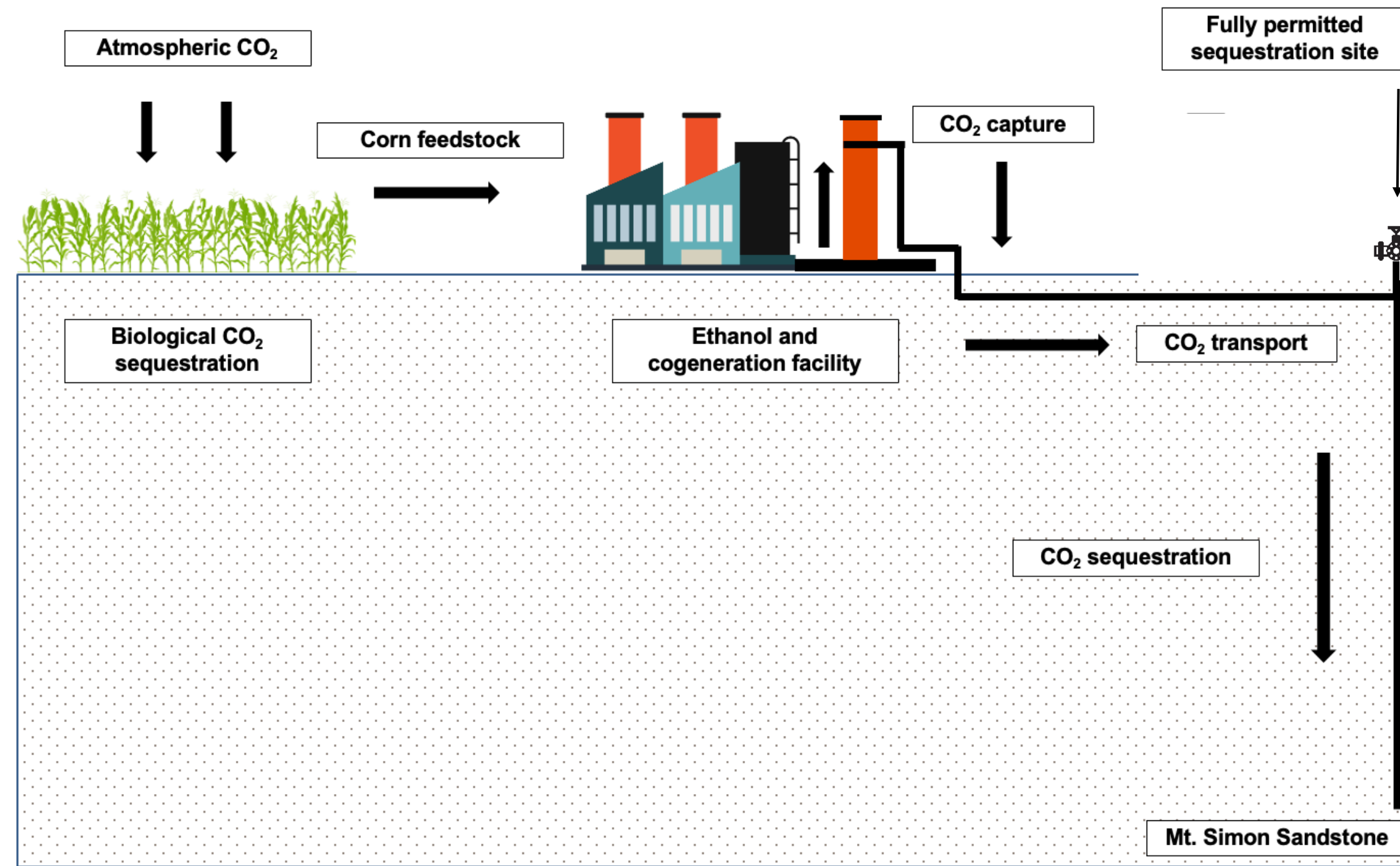
The Mt. Simon Hub lowers the carbon intensity of ethanol, bolstering its position as a premier alternative fuel:

- Supports the sustainability of Iowa agriculture in the long-term
- Helps achieve regional, national and global carbon reduction goals
- Provides significant environmental benefits
- Positions ethanol for attractive export markets and alternative uses like Sustainable Aviation Fuel (SAF)



Wolf Carbon Solutions | Mt. Simon Hub

Combining Agriculture + Infrastructure to Reduce Atmospheric Carbon



CO₂ Emissions From Ethanol

Lifecycle (Well-to-Wheels) Greenhouse Gas Emissions for Gasoline (grams of CO₂-equivalent GHG per megajoule of energy)



Oil Extraction, Pre-Processing and Transportation to Refinery = 11 g/MJ

- Energy use for crude oil recovery
- Flaring
- Initial processing
- Energy use in pipelines, trains, barges

Oil Refining = 14 g/MJ

- Energy use for crude oil refining

Gasoline Distribution = 0.5 g/MJ

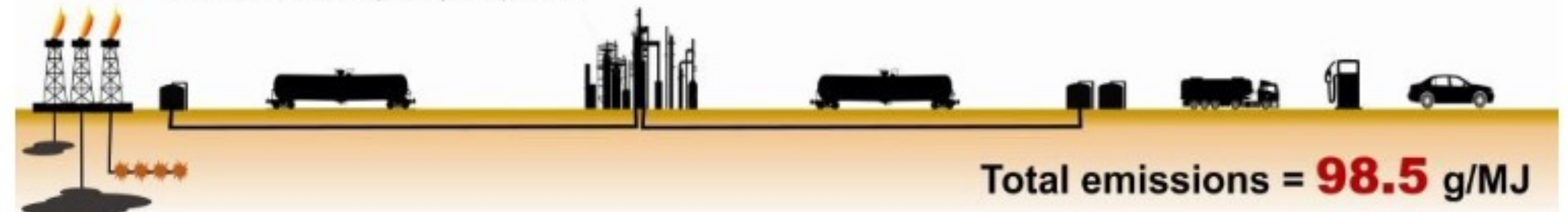
- Energy use in pipelines, trains, barges, trucks
- Energy use by fuel blenders and retailers

Gasoline Combustion = 73 g/MJ

- Tailpipe CO₂, CH₄, N₂O emissions

Land Use Change or Other Indirect Effects = ? g/MJ

- Not included in current lifecycle analyses for petroleum



Lifecycle (Well-to-Wheels) Greenhouse Gas Emissions for Ethanol (grams of CO₂-equivalent GHG per megajoule of energy)



Corn Production = 22 g/MJ

- Seed production
- Fertilizer production and use
- Chemical production and use
- Farm machinery energy use
- N₂O/CO₂ emissions from soils
- Animal feed co-product credit (-12)
- Hypothetical land use change (7)

Ethanol Production = 28 g/MJ

- Energy use (natgas, electricity) by ethanol biorefinery
- Denaturant addition

Ethanol Combustion = 0.3 g/MJ

- Tailpipe CO₂ emissions are *biogenic*
- Minor tailpipe CH₄ and N₂O emissions

Corn Transport = 1.5 g/MJ

- Energy use by trucks, trains, barges

Ethanol Distribution = 1.5 g/MJ

- Energy use by trucks, trains, barges
- Energy use by fuel blenders and retailers



Why Remove CO₂ from Ethanol?

Lifecycle (Well-to-Wheels) Greenhouse Gas Emissions for Ethanol with climate-smart farming practices, CCS, renewable energy (grams of CO₂-equivalent GHG per megajoule of energy)



Corn Production = 0 to 5 g/MJ

- Seed production
- Climate-smart fertilizer production and use
- Climate-smart chemical production and use
- Biofuel use in farm machinery
- N₂O/CO₂ emissions from soils
- Animal feed co-product credit (-12)
- Hypothetical land use change (7)
- Soil carbon sequestration (-15)

Ethanol Production = -15 to 5 g/MJ

- Energy use (natgas, electricity) by ethanol biorefinery
- Denaturant addition
- Capture and sequestration of fermentation CO₂ (-25 to -30)
- Biogas/renewable electricity use

Ethanol Combustion = 0.3 g/MJ

- Tailpipe CO₂ emissions are biogenic
- Trace tailpipe CH₄ and N₂O emissions

Corn Transport = 1.5 g/MJ

- Energy use by trucks, trains, barges

Ethanol Distribution = 1.5 g/MJ

- Energy use by trucks, trains, barges
- Energy use by fuel blenders and retailers



Lifecycle (Well-to-Wheels) Greenhouse Gas Emissions for Battery Electric Vehicle (grams of CO₂-equiv. GHG per megajoule of energy)



Natural Gas, Oil or Coal Extraction = 3-6 g/MJ

- Energy use for natgas, oil, or coal recovery
- Initial processing

Rare Mineral Extraction (batteries) = 3-9 g/MJ

- Energy use for mineral recovery
- Initial processing

Fossil Fuel & Mineral Transport = 1-2 g/MJ

- Energy use for pipelines, trucks, trains, barges

Battery Manufacturing = 2-5 g/MJ

- Energy use for battery manufacturing

Land Use Change or Other Indirect Effects = ? g/MJ

- Not included in current lifecycle analyses for EVs

Electricity Generation = 0-298 g/MJ

- Coal = 298 g/MJ
- Natural Gas = 122 g/MJ
- Oil = 285 g/MJ
- Nuclear = 0-10 g/MJ
- Wind/Solar/Hydro = 0-10 g/MJ

Electricity Use in Vehicle = 0 g/MJ

- No tailpipe emissions
- EV drivetrain ~3 times more efficient per unit of energy vs. ICE drivetrain

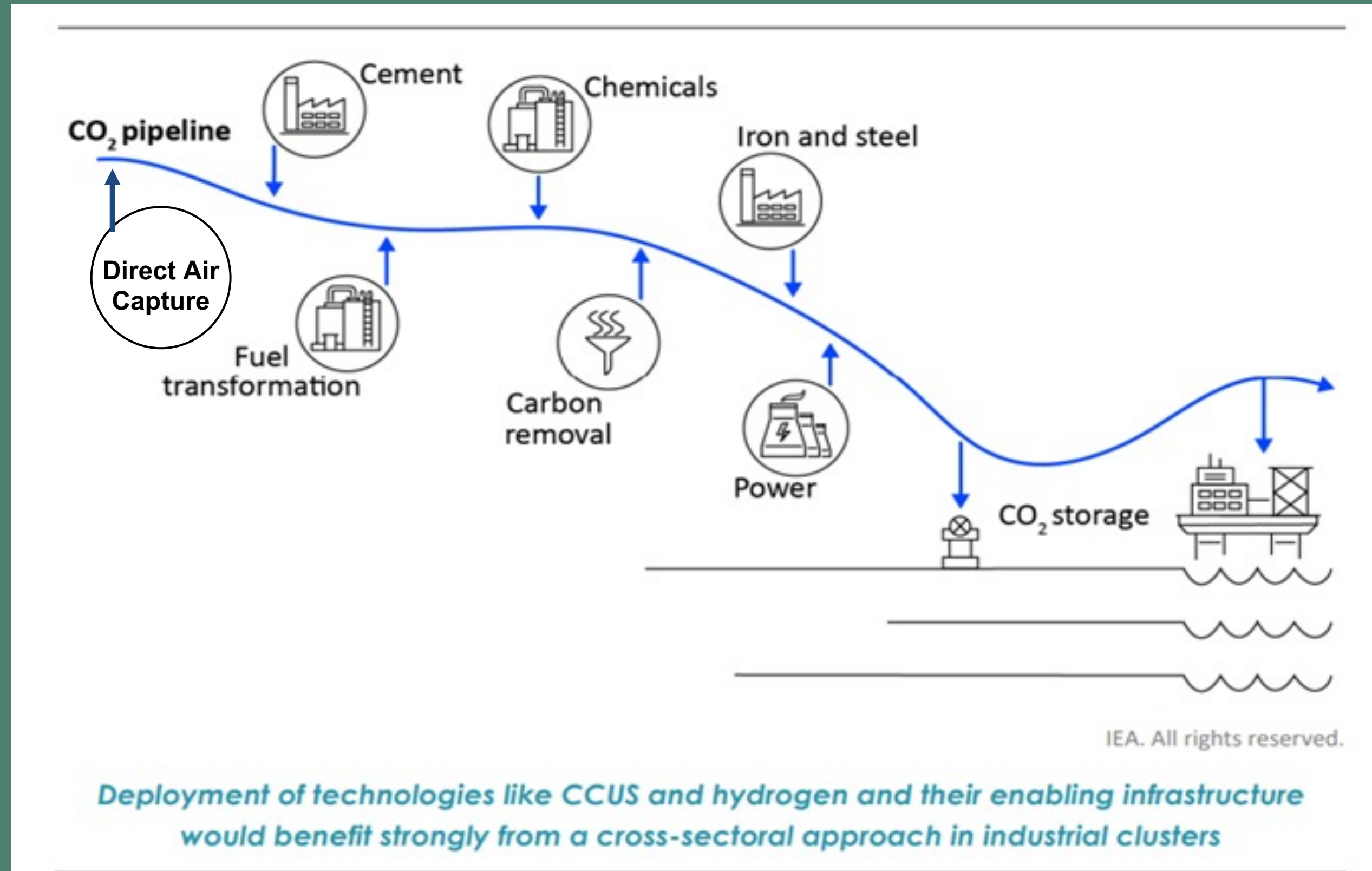
Electricity Transmission = 1-3 g/MJ

- Energy use for transmission
- Transmission losses



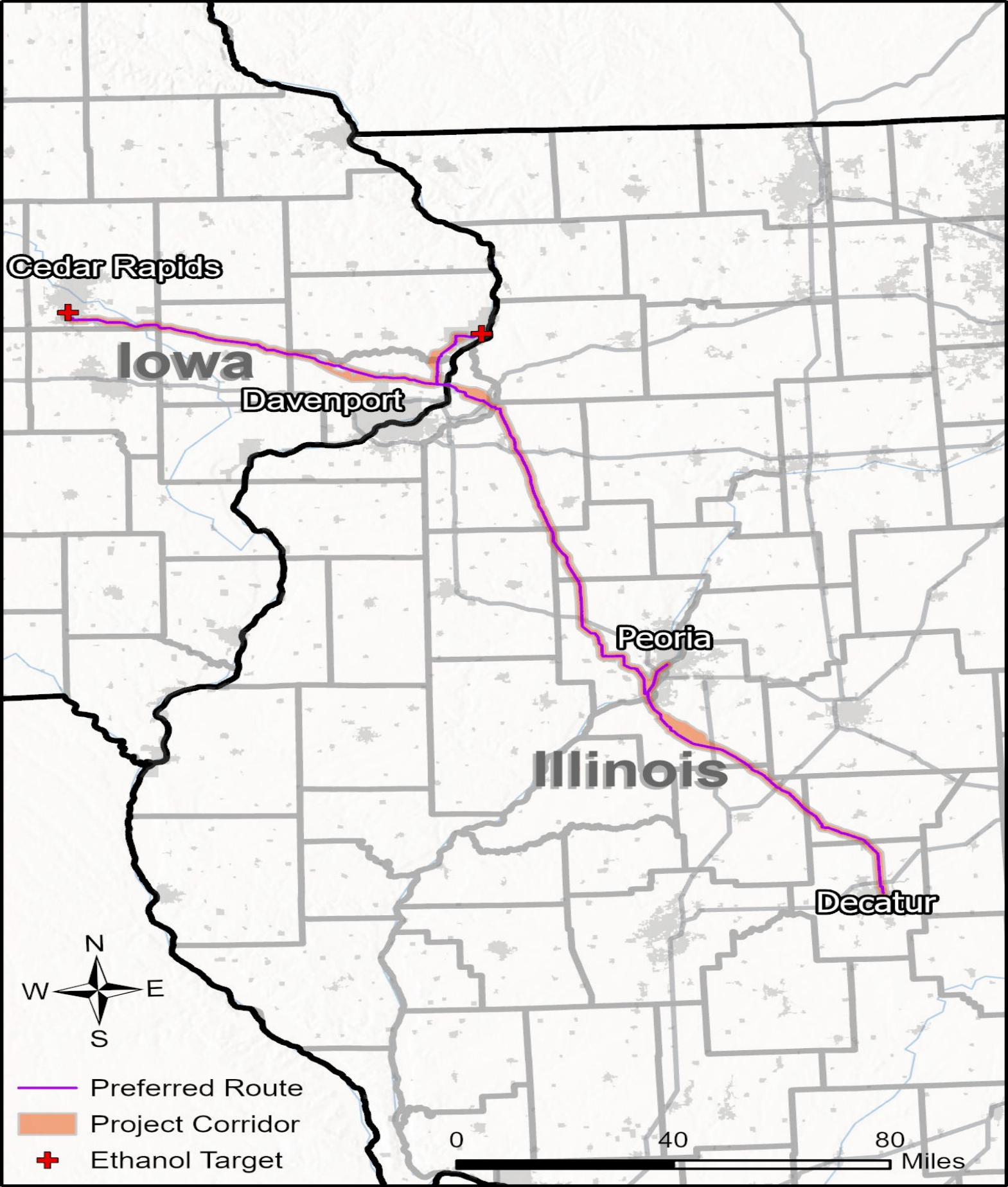
CO₂ Pipelines Serve and Sustain Iowa Industries

- The **demand for industrial products is expected to increase** as economies grow and standards of living rise. To meet this demand, Iowa will need manufacturing solutions that are more climate-friendly than those currently available.
- There is **no other current technology available** that can decarbonize Iowa's larger emitting, but essential, industries like manufacturing, chemicals, and agricultural processing.
- A study from the International Energy Agency (IEA) shows that to limit planet warming to 2 degrees Celsius, carbon capture **contributes 20 percent of necessary emissions reductions annually by 2050**, with half those reductions from industrial processes **that have no other cost-effective way to decarbonize**.



Preliminary Route Map and Project Schedule

PROJECT SCHEDULE	
Date	Activity
Q1 2022	Initial outreach with local communities
Q2 2022	Initiate regulatory approval process
2023	Right-of-Way (ROW) negotiation
Q2 2024	Construction start
2025	Project in-service



County-specific Information



Wolf Carbon Solutions | Mt. Simon Hub

Wolf Carbon Solutions in Linn County



Estimated route miles in Linn County: 19.27

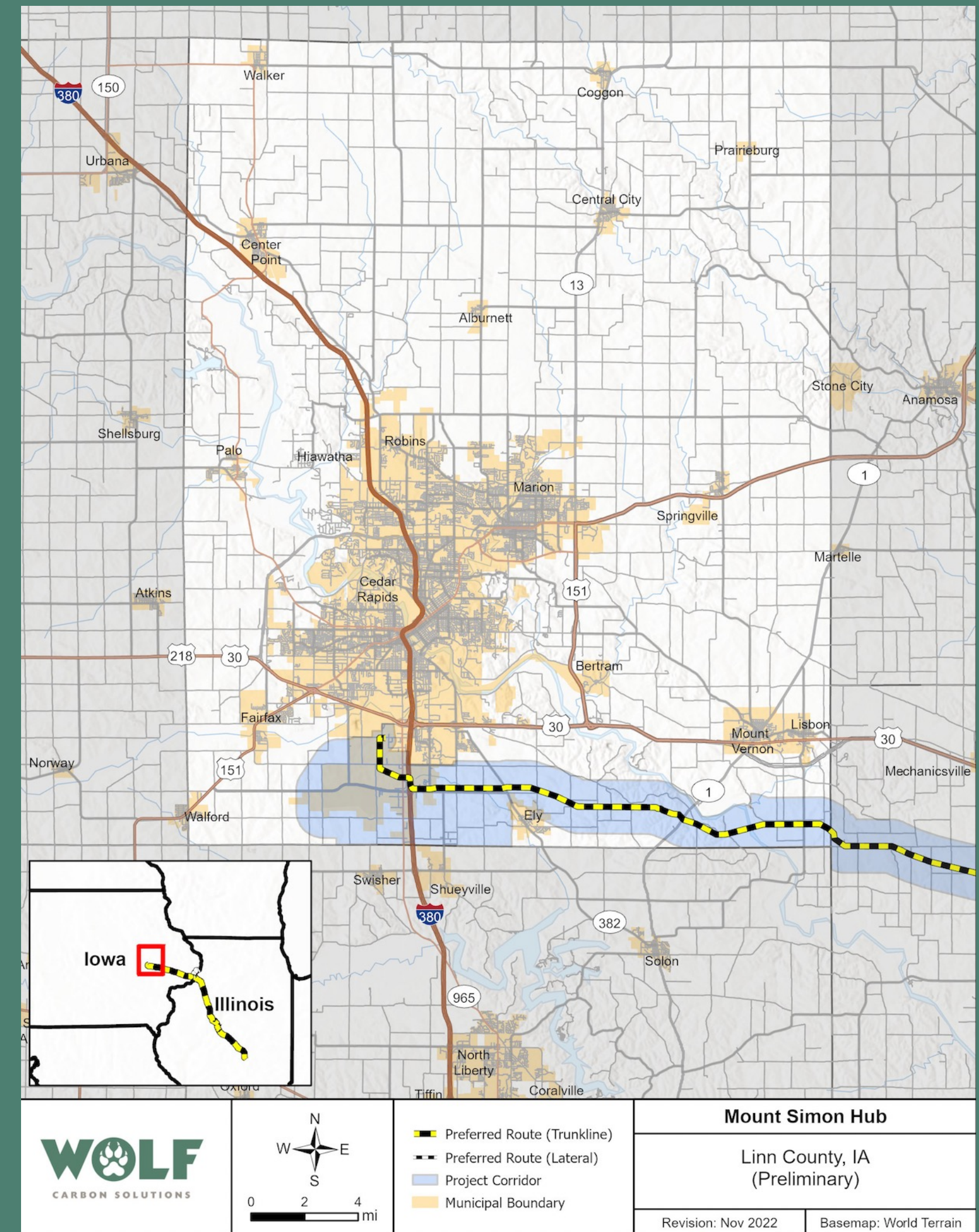


Proposed Corridor:

Wolf has chosen a wide, 2-mile corridor to accommodate landowner feedback in determining the Right-of-way (ROW)



Wolf Carbon Solutions | Mt. Simon Hub



**Iowa Total Economic Impact Representative of
Construction and Operation: 2024 -2036**

Economic Impact:
\$1.1 Billion

Wages and Salaries:
\$306 Million

Total State and Local Taxes:
\$54.7 Million

**of which \$23.7 Million is attributed to
Property Taxes**

Economic Impact: By the Numbers*



311 estimated jobs in Linn County over an
8-month construction period



\$22 Million estimated wages and salaries
over an 8-month construction period

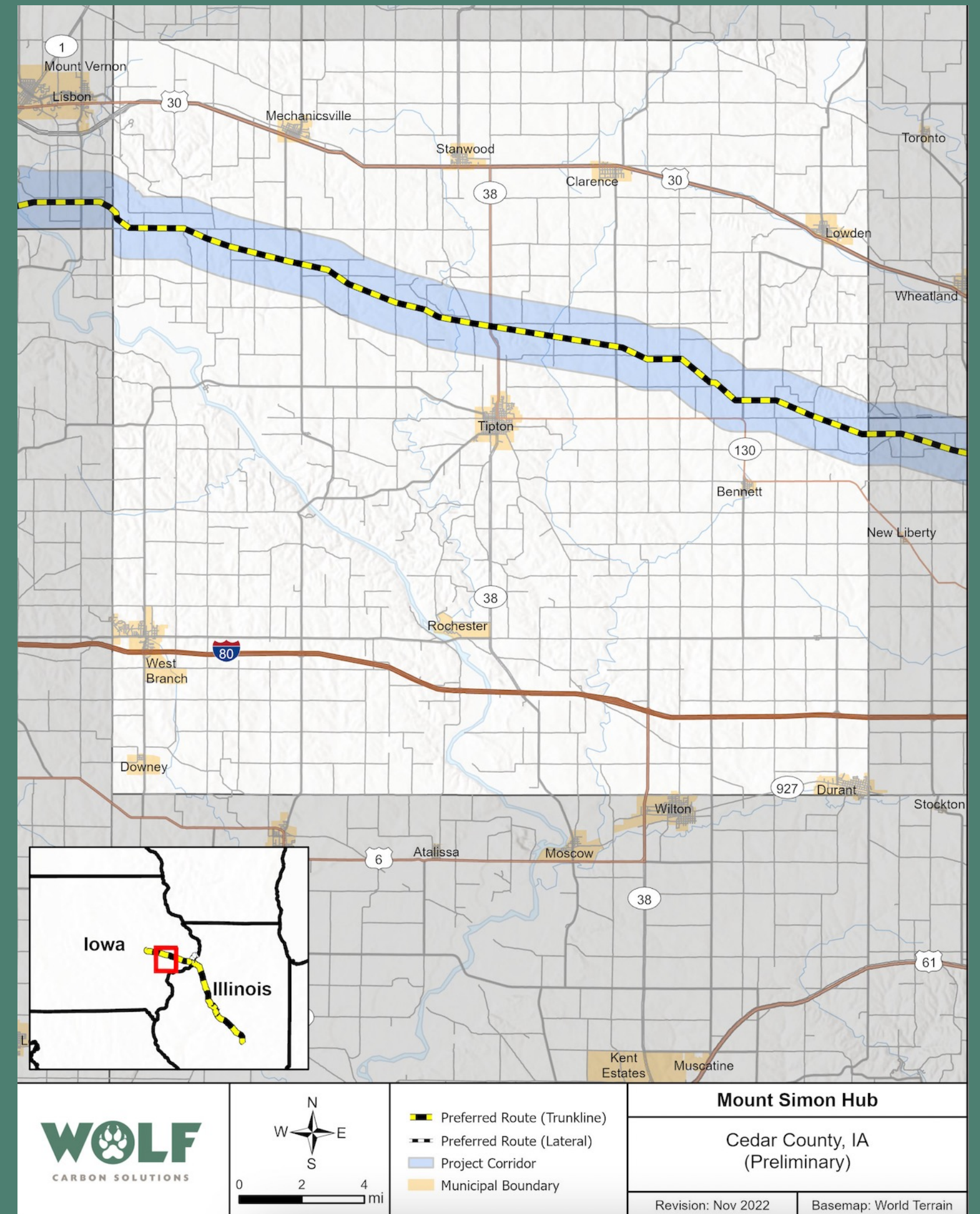
Wolf Carbon Solutions in Cedar County



Estimated route miles: 25.84



Proposed corridor: Wolf has chosen a 2-mile corridor for the pipeline in anticipation of amending the Right of Way (ROW) to accommodate landowner feedback



Wolf Carbon Solutions| Mt. Simon Hub

Economic Impact: By the Numbers*



232 estimated jobs in Linn County over an 8-month construction period



\$16 Million estimated wages and salaries over an 8-month construction period

*According to economic analysis performed by Goss & Associates

Iowa Total Economic Impact Representative of Construction and Operation: 2024 -2036

Economic Impact:
\$1.1 Billion

Wages and Salaries:
\$306 Million

Total State and Local Taxes:
\$54.7 Million

of which \$23.7 Million is attributed to
Property Taxes

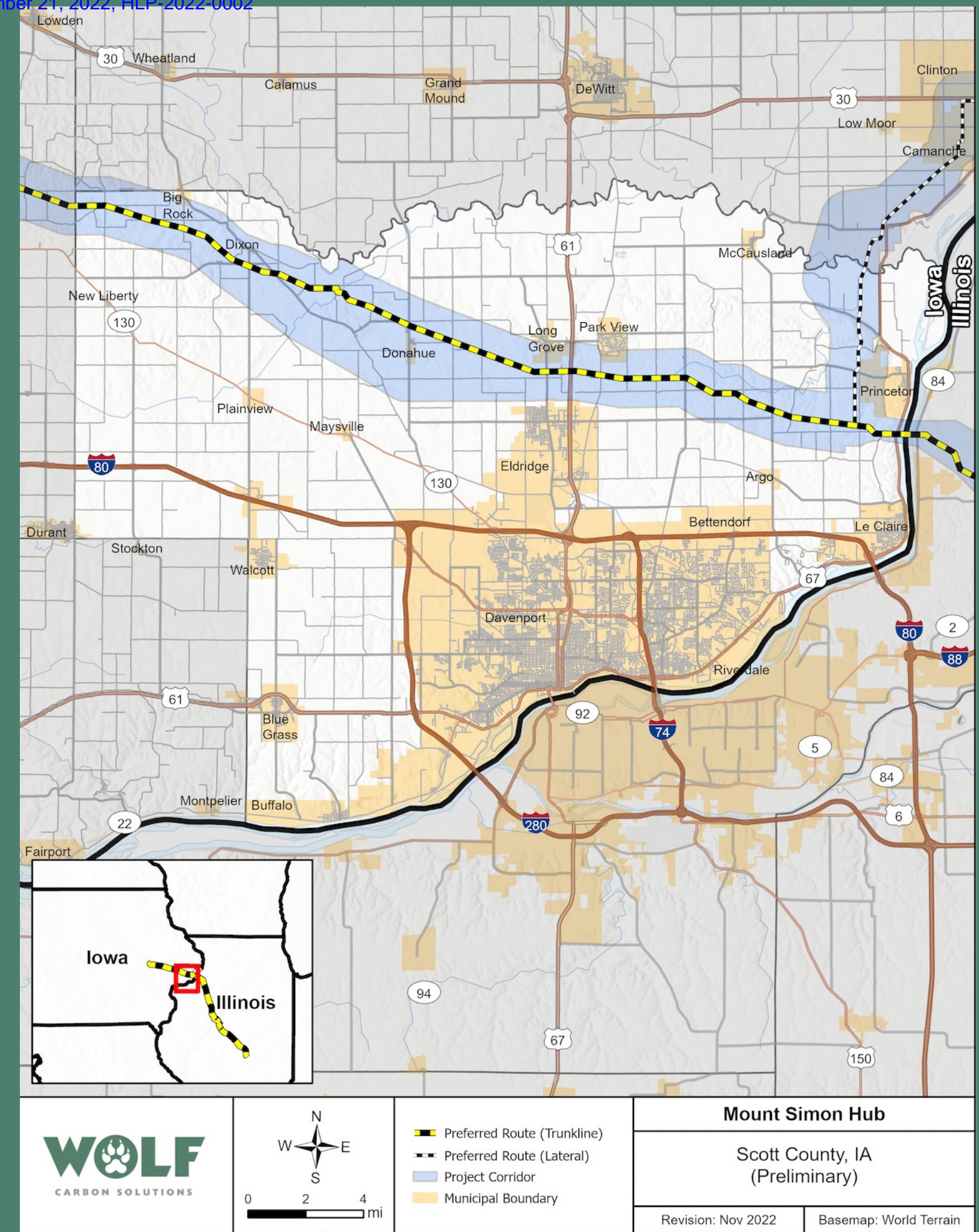
Wolf Carbon Solutions in Scott County



Estimated route miles: 36.14



Proposed corridor: Wolf has chosen a 2-mile corridor for the pipeline in anticipation of amending the Right of Way (ROW) to accommodate landowner feedback



Wolf Carbon Solutions| Mt. Simon Hub

Economic Impact: By the Numbers*

Iowa Total Economic Impact Representative of Construction and Operation: 2024 -2036

Economic Impact:
\$1.1 Billion

Wages and Salaries:
\$306 Million

Total State and Local Taxes:
\$54.7 Million

of which \$23.7 Million is attributed to
Property Taxes



434 estimated jobs in Linn County over an
8-month construction period



\$30 Million estimated wages and salaries
over an 8-month construction period

*According to economic analysis performed by Goss & Associates

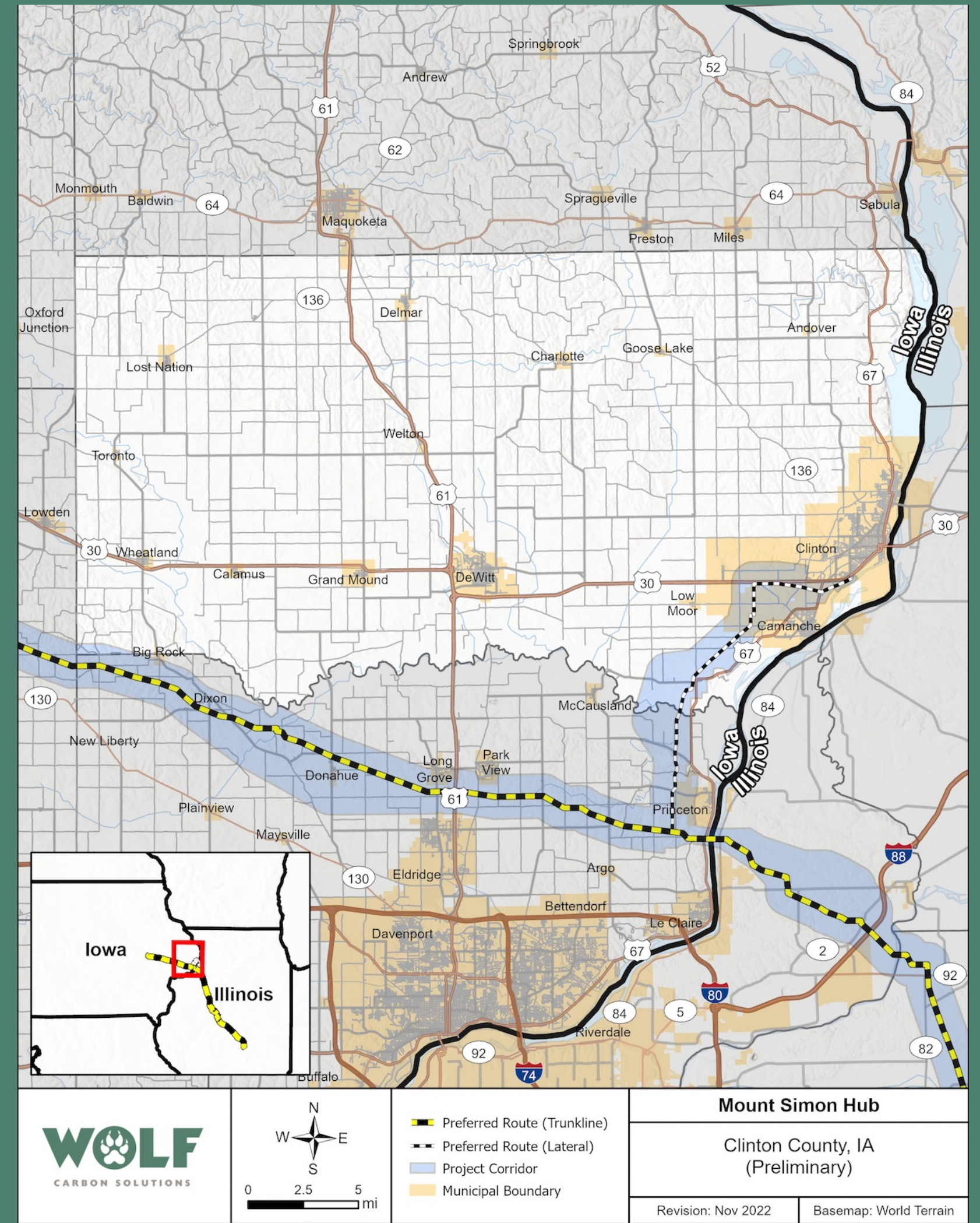
Wolf Carbon Solutions in Clinton County



Estimated route miles: 11.98



Proposed corridor: Wolf has chosen a 2-mile corridor for the pipeline in anticipation of amending the Right of Way (ROW) to accommodate landowner feedback



Wolf Carbon Solutions| Mt. Simon Hub

Economic Impact: By the Numbers*



144 estimated jobs in Linn County over an 8-month construction period



\$10 Million estimated wages and salaries over an 8-month construction period

*According to economic analysis performed by Goss & Associates

Iowa Total Economic Impact Representative of Construction and Operation: 2024 -2036

Economic Impact:
\$1.1 Billion

Wages and Salaries:
\$306 Million

Total State and Local Taxes:
\$54.7 Million

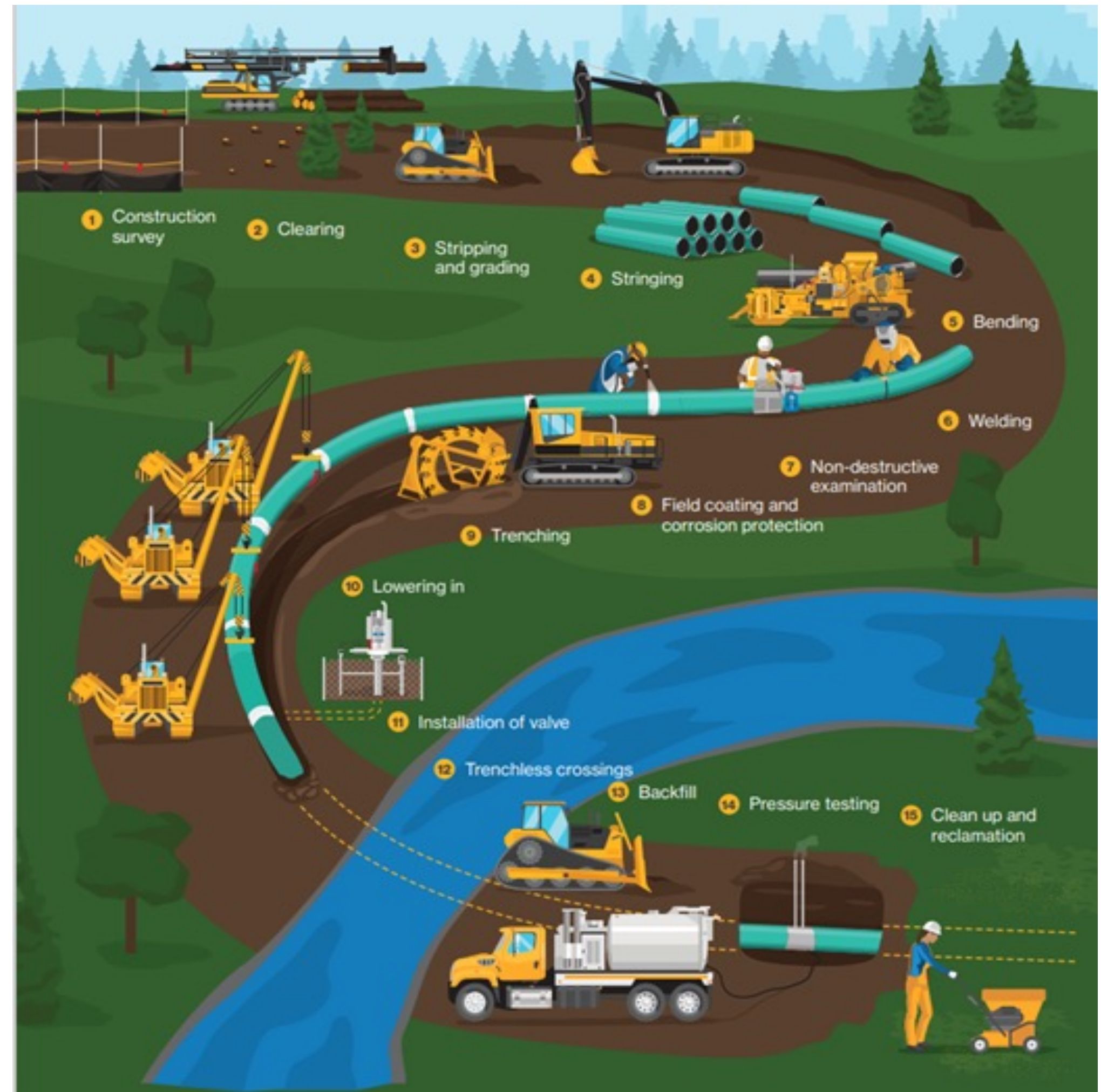
of which \$23.7 Million is attributed to
Property Taxes

Phases of Pipeline Development

We Work Safe

Wolf has an uncompromising commitment and respect for health, safety and the environment.

We are committed to a positive and sustainable safety culture that is supported by socially responsible environment, health and safety management practices and effective environmental stewardship programs and public safeguards.



Wolf Carbon Solutions| Mt. Simon Hub

After One Year of Construction



Pipeline Design and Construction

Pipeline Design and Construction Quality Management is focused on:

- Ensuring integrity of the pipeline
- Minimizing impact of pipeline construction on environment, land quality, and the community
 - Wolf Carbon Solutions' approach to Construction Quality Management will focus on respecting and preserving the unique characteristics of the region, including, but not limited to, deep topsoil, drain tiles, and high-value crops

Pipe Manufacturing

- Chemical composition testing of pipeline material
- Strength testing (tensile, hydrostatic)
- Ductility and toughness testing
- Inspections for defects
- Dimensional tolerances
- External coating inspection

Pipeline Construction

- Rigorous construction specifications
- Qualified welding procedures
- 100% radiographic or ultrasonic inspection of welds
- Joint coating inspections
- Depth of cover survey
- Hydrostatic and leak tests
- Construction damage inspection
- Cathodic Protection System installation



Landowner Engagement Process

- Landowners will receive a call or in-person visit from a designated Right of Way Agent
- Wolf has chosen a 2-mile corridor for the pipeline in anticipation of amending the Right of Way to accommodate landowner feedback
- Landowners can contact Wolf Carbon Solutions directly at mtsimonhub@wolfcarbonsolutions.com or at 800-501-5597 to be connected to an assigned Agent
- An independent third-party company will conduct land value market studies for each County on behalf of Wolf Carbon Solutions
- Right of Way personnel will look at each tract individually to determine any special circumstances that should be taken into consideration during negotiations
- While Wolf Carbon Solutions will provide a basic formula as a starting point for negotiations, we recognize that not all Right of Way costs are identical. Wolf Carbon Solutions is committed to learning about each individual tract of land and the impact that crossing will have



Land Use Compensation

Wolf Carbon Solutions is an **experienced energy infrastructure company** that operates with accountability and respect for our landowners, rightsholders and stakeholder partners.

Our entire ACTL right of way was voluntarily negotiated without using eminent domain or condemnation.

Agricultural and Drain Tile Mitigation

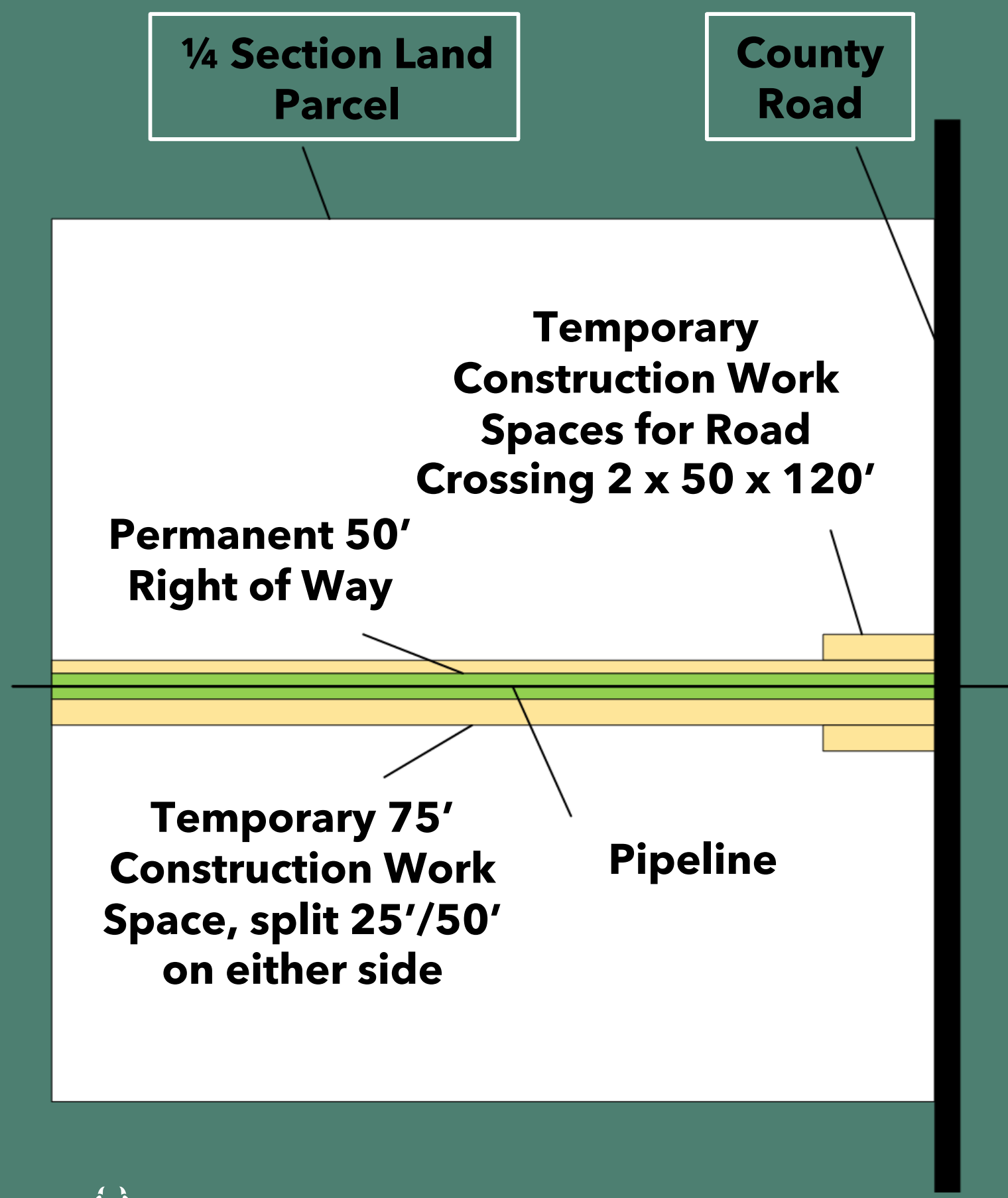
- From route selection through construction and mitigation, Wolf is committed to close collaboration with landowners to minimize impacts to their property and business.
- Our drain tile mitigation plans will be property-specific and serve as a set of guidelines to manage, mitigate and ensure proper restoration of drain tile systems, conducted by a qualified drain tile contractor.

Four-Year Yield Loss Compensation

- Year One: 100% Yield
- ↓
- Year Two: 80% Yield
- ↓
- Year Three: 60% Yield
- ↓
- Year Four: 40% Yield



ROW Configuration Model



Description	Acres	Compensation Model
Permanent Right of Way	3.0 ac	Land Value (based on market assessment or appraisal) <ul style="list-style-type: none">•20% upon execution•80% prior to construction
Temporary Work Space	4.8 ac	50% of Land Value <ul style="list-style-type: none">•20% upon execution•80% prior to Construction
Crop Damages	7.8 ac	Crop Yield x Market value <ul style="list-style-type: none">Year 1 - 100%Year 2 - 80%Year 3 - 60%Year 4 - 40%
Other		Inconvenience, unanticipated construction damages (e.g., fences)
Reclamation		Wolf Carbon Solutions is responsible for reclamation post-construction, and to monitor and repair post-construction or maintenance issues throughout the operational life of the pipeline. Appropriate crop damages and inconvenience costs provided to landowner

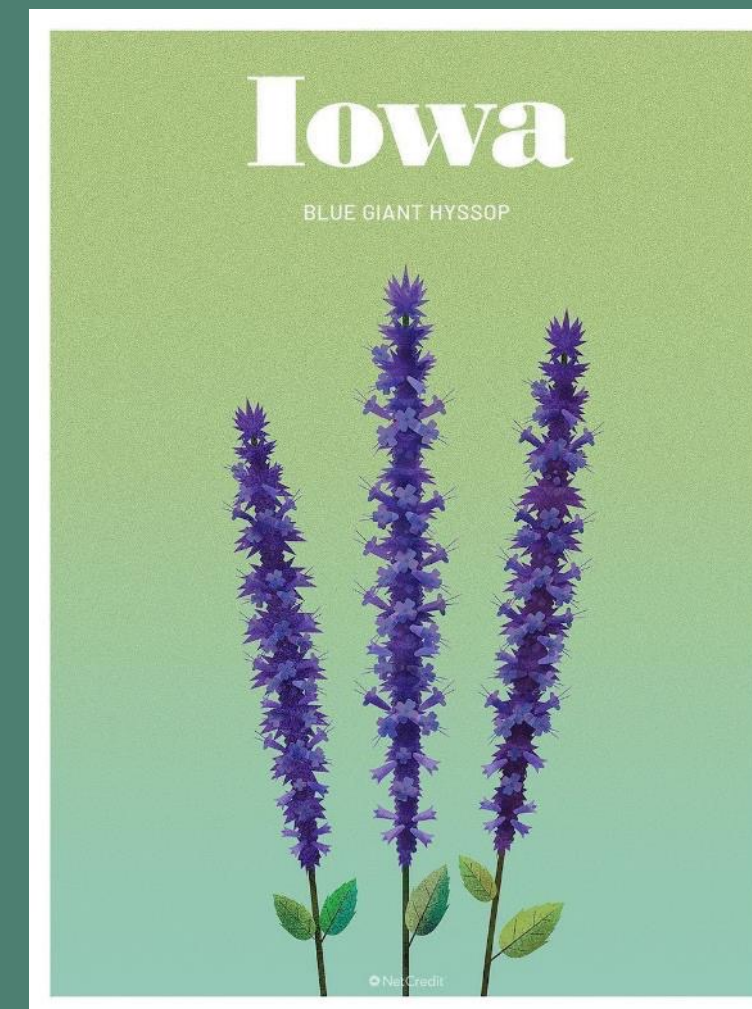


Environmental Stewardship

The Mt. Simon Hub will be designed, built, maintained and operated with stringent focus on mitigating impacts to sensitive environmental resources, and avoiding, minimizing, and abating impacts to these resources to preserve and protect the environment. Federal agencies regulate environmental related aspects of CO₂ pipelines: the EPA, the U.S Army Corp of Engineers, the US Fish and Wildlife Service and PHMSA. Wolf will also coordinate with the Iowa and Illinois Departments of Natural Resources to manage sensitive resources along the proposed pipeline.

Effective Environmental Planning and Protection

- Agricultural mitigation plan for topsoil management and land restoration to meet or exceed state code.
- Wetlands protection - avoidance where possible and a minimized workspace
- Navigable waterway crossings via trenchless installation technology
- Threatened and endangered species consultations for 100's of Federal and State species: habitat identification, seasonal surveys, and existing data
- Protection of aquifers, ground water, and municipal water sources
- Storm water management and erosion control
- Clean Air Act compliance
- Cultural resources investigations and surveys to comply with the National Historic Preservation Act



Operations and Maintenance

The Mt. Simon Hub will be regulated by the Pipelines and Hazardous Materials Safety Administration (PHMSA). PHMSA regulates all safety-related aspects of CO₂ pipelines, including design, construction, maintenance and operations.

Regulatory Compliance and Integrity Management - Prevention

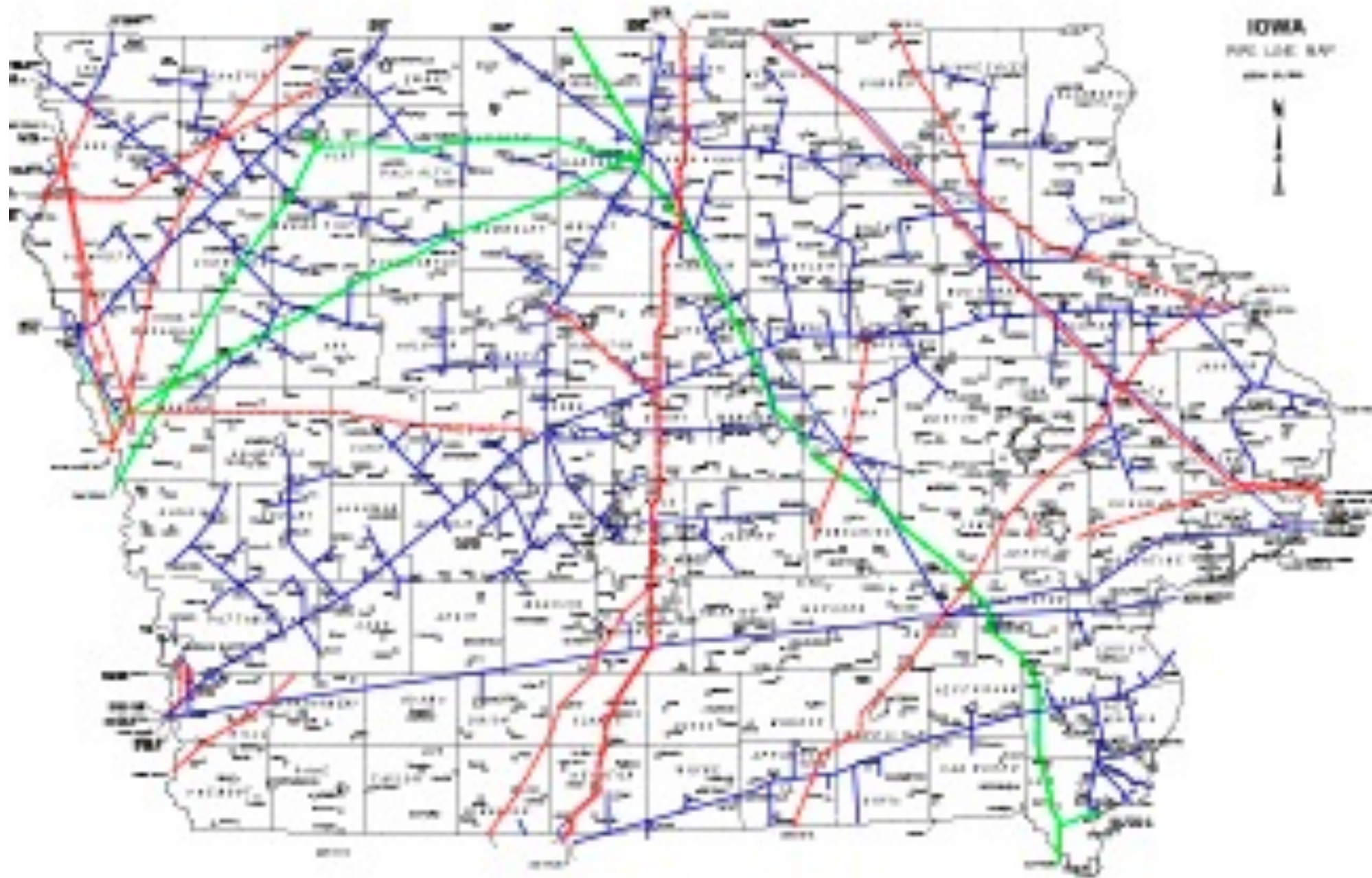
- Active PHMSA collaboration and future CO₂ regulation enhancements
- Public Awareness (PA) Programming and continuous stakeholder outreach
- Ongoing operating procedures and operator training specific to CO₂ properties
- Receipt points with remote shut-in, continuously monitored for product quality
- Water removed to minimize the risk of internal corrosion
- Cathodic protection installed to minimize the risk of external corrosion
- Geohazard identification and inspection program
- Damage Prevention Plan, 811 “one call” activation, pipeline markers, and ongoing aerial patrols
- Comprehensive Integrity Management Plan that includes baseline inspections in addition to periodic internal inspections
- Ongoing PHMSA (external) and Wolf (internal) audits and inspections to ensure program effectiveness



Pipelines 101

Pipelines are the **safest, most reliable and efficient** manner of transporting energy products - - **delivering fuel to our homes, our businesses, providing the basis for the materials that we use every day, and supporting and sustaining the American economy.** .

- There are **over 2.6 million miles pipelines traveling through the U.S. today**, nearly **43,00 miles in Iowa**, providing a vital link between producers and consumers.
- **Over 5,300 miles of these pipelines are carbon capture lines.**
- Statistics gathered by the U.S. Department of Transportation's Pipeline and Hazardous Materials Safety Administration report that pipelines **make up less than one one-hundredth of one percent (.01%)** of all transportation incidents in the United States.
- Once our pipelines are in place, we work to prevent incidents by **evaluating, inspecting and maintaining** pipelines in a program called integrity Management – **detecting and mitigating incidents before they happen.**



The map above is representative of all oil, gas and product pipelines traversing Iowa today (source Business Record.).

Our employees will live, work and recreate in these communities, and we are **committed to developing and maintaining a long-term relationship as your neighbor.**

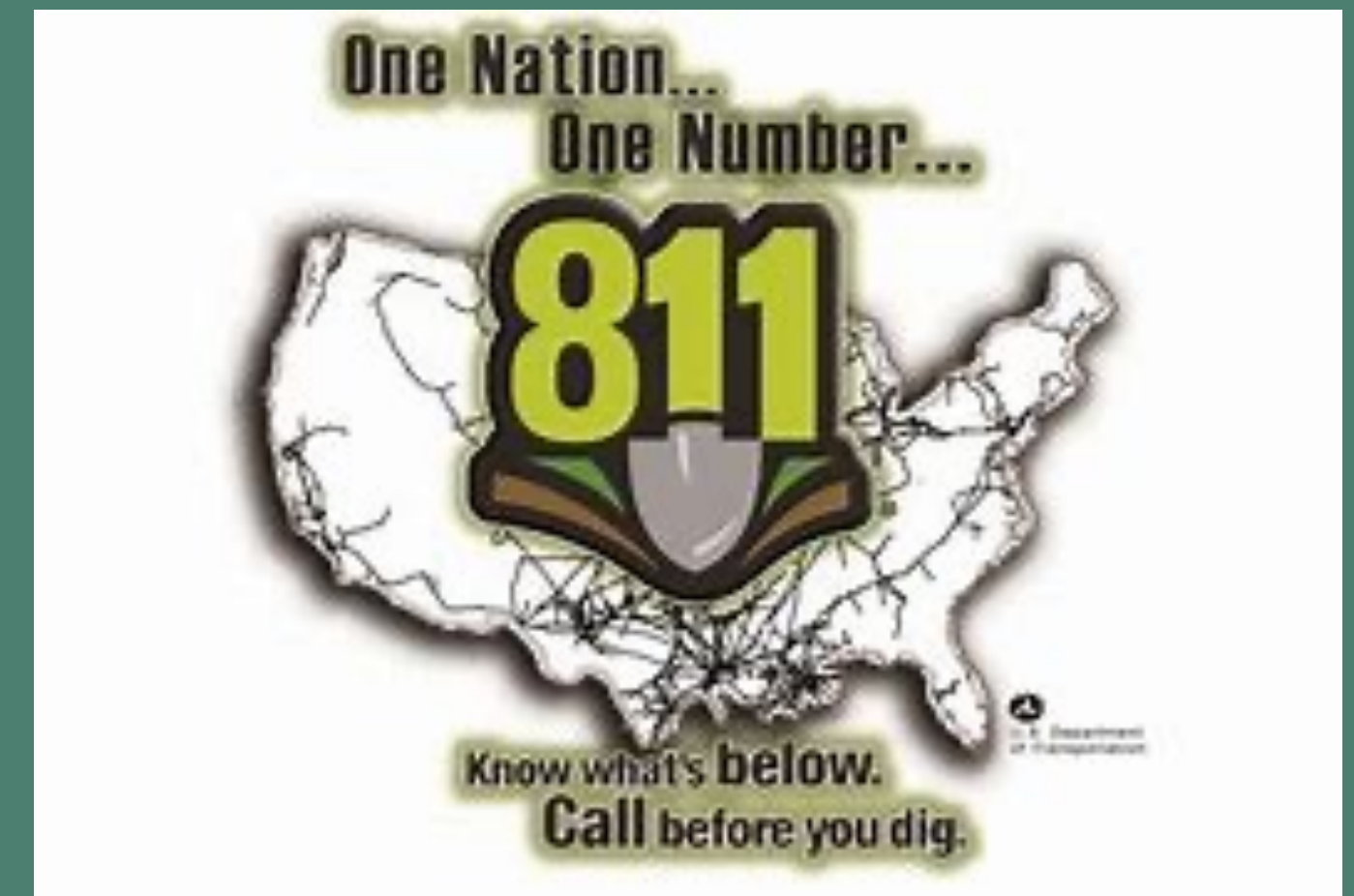


Our Commitment to Safety and Response

The Mt. Simon Hub will be regulated by the Pipelines and Hazardous Materials Safety Administration (PHMSA). PHMSA regulates all safety-related aspects of CO₂ pipelines, including design, construction, maintenance and operations.

Effective Safety Plan Execution and Response

- 24/7 control room monitoring and management of our pipeline footprint
- Comprehensive dispersion modeling
- Public Awareness (PA) Programming that includes first responder outreach and ongoing education
- Ongoing first responder training specific to CO₂ properties
- Supplemental support of local responder resources and equipment
- Increased pipe wall thickness near environmentally sensitive areas and population centers
- Best in class leak detection technology
- Remote shut-in valves with a rapid response time
- Emergency Response Programming, national program level execution, comprehensive local responder engagement and continuous exercises and drills
- PHMSA reporting and investigation for all incidents - zero tolerance



Our Commitment to Transparency and Collaboration

While there are multiple Carbon Capture and Storage (CCS) projects proposed in Iowa and Illinois, there is only one **Wolf Carbon Solutions, Mt. Simon Hub.**

To date, Wolf Carbon Solutions has met with over 100 elected and appointed federal, state and local stakeholders to obtain feedback to support the research and development of the proposed **Mt. Simon Hub**.

Just the Facts

- **Wolf has an established track record as a **life-of-asset** infrastructure company**
- **Wolf has an established track record developing, constructing and **safely operating** CCS infrastructure**
- **Wolf has an established track record of **voluntary ROW** negotiations without the use of eminent domain**
- **Wolf is a **dedicated community partner** with Iowan, agricultural roots**
- **Wolf's proposed Mt. Simon Hub **supports Iowa's agricultural and farm economy**, as well as the **ethanol supply chain****
- **Wolf is committed to working with an **established Public Awareness provider** to ensure communication, training and equipment consistency between the company and local first responders**



Thank you



Wolf Carbon Solutions | Mt. Simon Hub

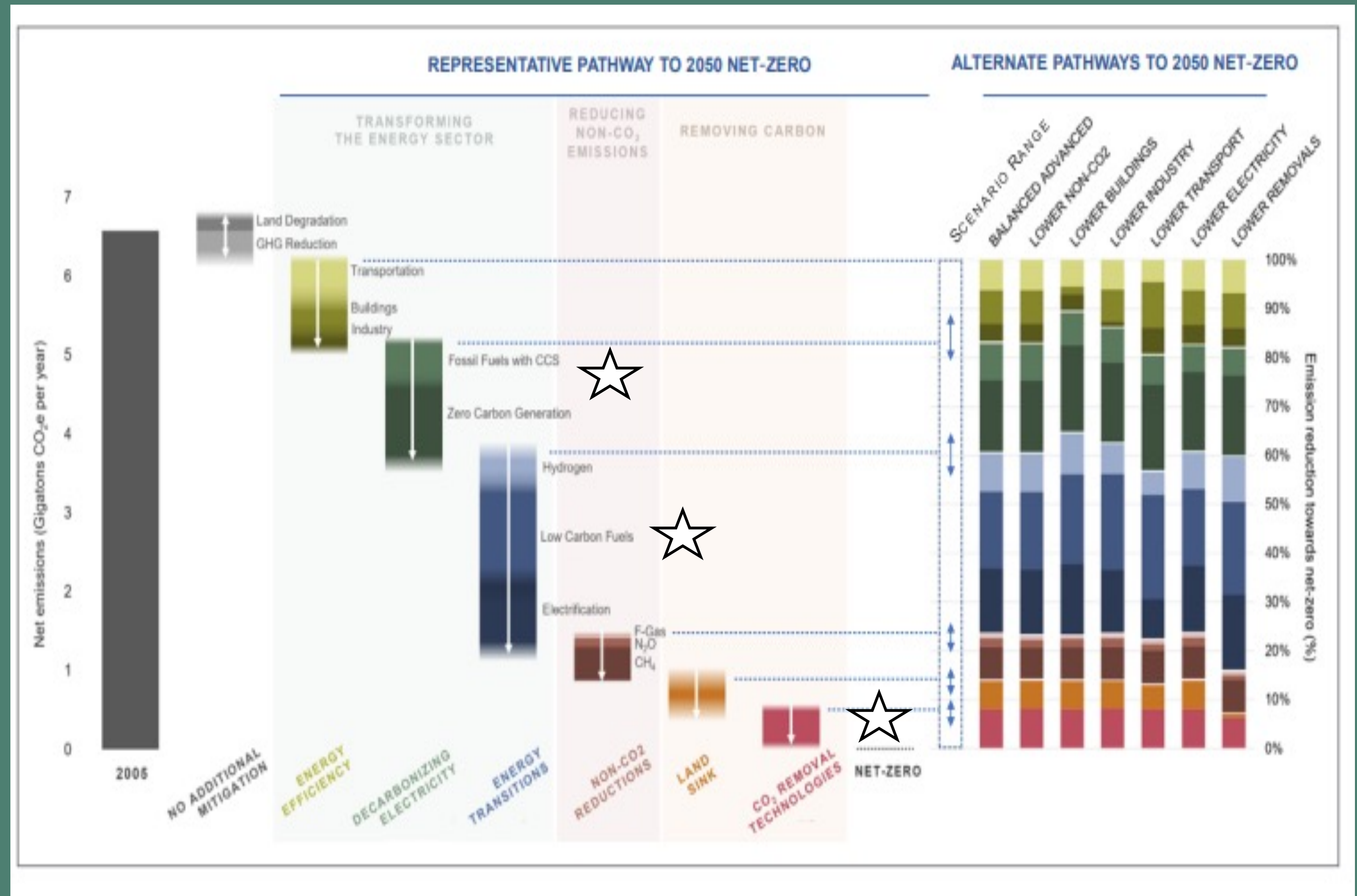
Appendix



Wolf Carbon Solutions | Mt. Simon Hub

The Pathway to Net Zero by 2050

★ Carbon Capture and Storage (CCS) plays a significant role in the **United States achieving a net zero economy** – all while creating good paying union jobs and providing clean and reliable energy.



Source: The Long-term Strategy of the United States
Pathways to Net Zero Greenhouse Gas Emissions by 2050





Learn more at wolfcarbonsolutions.com